MMS ENVIRONMENTAL STUDIES PROGRAM: ONGOING STUDIES

Region: Alaska

Planning Areas: Beaufort Sea

Title: Evaluating the Potential Relict Arctic Invertebrate and Algal Community on the West Side of Cook Inlet (AK-93-48-60)

MMS Information Needs to be Addressed: An evaluation of the lower western Cook Inlet intertidal and subtidal invertebrates and algae will potentially lead to a better understanding of the potential effects of offshore oil and gas, or other mineral, exploration and extraction on the outer continental shelf. New information will support NEPA analysis and documentation for future Cook Inlet Lease Sales, DPPs, and monitoring.

Actual Costs: $60,000 **Period of Performance:** FY 2005-2008

Conducting Organization: CMI, UAF

MMS Contact: Chief, Alaska Environmental Studies Section

Description:
Background This study is based on previous work conducted on the lower west side of Cook Inlet when taxonomic identifications of epifaunal invertebrates collected in the 1970's for the OCS Environmental Assessment Program bore a striking resemblance to species reported for the Alaskan Arctic. Additional information provided by other historical invertebrate collections in the area indicate that these west side species and assemblages more closely matched Arctic species and assemblages than those on Cook Inlet's east side or in other areas of the Gulf of Alaska. Few studies have been conducted in the Bering or Chukchi Seas or Norton Sound, making it difficult to conduct a suitable comparison of species between Cook Inlet and the Arctic. From the limited comparisons, though, it is possible that many of the species do not occur nearer to the populations in western Cook Inlet than the Beaufort Sea, effectively isolating these species from similar species or genera. Based on its duration, it is possible that geographic isolation has allowed some species to become genetically distinct, to the point of evolving into separate subspecies or species. Thus, this assemblage is very interesting in evolutionary terms.

While defining biogeographical regions in coastal Alaska, scientists have placed upper Cook Inlet in the sub polar Beringian Province rather than the Aleutian Province with the adjacent Gulf of Alaska. This classification was based on fish assemblages, the occurrence of an isolated population of beluga whales, and water column characteristics (i.e., water temperature and salinity). They noted that this apparently unique region "is not represented in the system of marine protected areas in the United States." Given their potential isolation, these western Cook Inlet populations could be at risk of significant habitat perturbation and may prove to be sensitive indicators of climate change or other ecological shifts. Monitoring their distributions and abundance could provide "early-warning" signals.

Objectives

1. Develop a more complete comprehension of the species composition of the intertidal and subtidal benthic assemblages on the west side of Cook Inlet.
2. Evaluate the degree of geographic isolation for each potential relict Arctic species.
3. Determine the taxonomic status of the species observed on the west side of Cook Inlet.

Methods

1. Conduct a survey of archived specimens from the west side of Cook Inlet.
2. Review species lists from previous studies conducted on the east side of Cook Inlet, the Alaska Peninsula, Kodiak, and in Shelikof Strait and the Bering Sea.
3. Conduct detailed taxonomic evaluations on a wide variety of algae and invertebrates, including those in previous collections that have been preserved and archived.

Current Status: No cost extension granted until May 2008.

Final Report Due: TBD

Publications Completed: None

Affiliated WWW Sites: http://www.mms.gov/alaska/

Revised Date: March 2008